

Draft Claims for USSN 09/535,300, filed March 24, 2000**Attorney's Docket Number: 2003118-0001**

1. An array comprising:
an optical fiber; and
a library of proteins or peptides covalently attached to the optical fiber in a linear arrangement, the library being combinatorial in that its members are generated via chemical reactions in which a first set of moieties is attached to a second set of intermediates so that a larger number of products is produced than different chemical reactions are performed.
2. An array comprising:
an optical fiber; and
a library of proteins or peptides covalently attached to the optical fiber in a linear arrangement, the library being combinatorial in that its members are generated via chemical reactions in which a first set of amino acids is attached to a set of growing polypeptide chains so that a larger number of products is produced than different chemical reactions are performed.
3. An array comprising:
an optical fiber; and
a collection of proteins or peptides covalently attached to the optical fiber in a linear arrangement, wherein the collection of proteins or peptides include a first subset of proteins or peptides having a first common structural feature, and further wherein the collection is arranged along the fiber such that members of the first subset are separated from one another by a first fixed distance.
4. An array comprising:
an optical fiber;
a collection of proteins or peptides linearly arranged along the optical fiber; and
a geometric substrate about which the optical fiber is wrapped in a spiral and in a single layer of fiber about the substrate.

5. An array comprising:
 - an optical fiber;
 - a collection of proteins or peptides linearly arranged along the optical fiber, wherein each of the proteins or peptides is covalently attached to the optical fiber; and
 - a geometric substrate about which the optical fiber is wrapped in a spiral and in a single layer of fiber about the substrate.
6. An array comprising:
 - an optical fiber;
 - a collection of proteins or peptides linearly arranged along the optical fiber; and
 - a geometric substrate about which the optical fiber is wrapped in a spiral and in a single layer about the substrate, whereby the proteins or peptides are exposed.
7. An array comprising:
 - an optical fiber; and
 - a library of proteins or peptides covalently attached to the optical fiber in a linear arrangement, wherein members of the library are related to one another by primary amino acid sequence, such that each member of a first subset of proteins or peptides within the library shares a first common amino acid, and each member of the first subset of proteins or peptides is separated from each next closest member by a first distance.
8. An array comprising:
 - an optical fiber;
 - a library of proteins or peptides covalently attached to the optical fiber in a linear arrangement, wherein members of the library are related to one another by primary amino acid sequence, such that each member of a first subset of proteins or peptides within the library shares a first common amino acid, and each member of the first subset of proteins or peptides is separated from each next closest member by a first distance; and
 - a geometric substrate about which the optical fiber is wrapped in a spiral and in a single layer about the substrate, whereby the proteins or peptides are exposed.

9. An array comprising:

an optical fiber; and

a library of peptides or proteins covalently attached to the optical fiber in a linear arrangement, such that each member of a first subset of peptides or proteins within the library has the same amino acid residue at a particular position of its primary sequence, and each member of the first subset of peptides or proteins is separated from each next closest member by a first distance.

10. An array comprising:

an optical fiber; and

a library of peptides or proteins covalently attached to the optical fiber in a linear arrangement, such that each member of a first subset of peptides or proteins within the library has the same amino acid residue at a first particular position of its primary sequence, and each member of the first subset of peptides or proteins is separated from each next closest member by a first distance;

such that each member of a second subset of peptides or proteins within the library has the same amino acid residue at a second particular position of its primary sequence, and each member of the second subset of peptides or proteins is separated from each next closest member by a second distance.

11. An array comprising:

an optical fiber; and

a library of proteins or peptides covalently attached to the optical fiber in a linear arrangement, the library being combinatorial in that its members are generated via chemical reactions in which a higher degree of complexity of the library is achieved upon each subsequent chemical reaction performed on the library, wherein library members sharing a common characteristic due to exposure to common reaction conditions are separated from one another by a fixed distance along the optical fiber.

12. An array of at least two different peptides or proteins covalently attached to an optical fiber, wherein the array has linear organization, and

wherein at least one protein or peptide is present at at least two different positions on the fiber and successive occurrences of each compound are separated by a constant interval.

13. An array of at least two different proteins or peptides covalently attached to an optical fiber,

wherein the array has linear organization; and

wherein the array is prepared by a method comprising steps of:

providing an optical fiber having reactive functionalities;

subjecting said fiber to reaction conditions to attach a first set of amino acids with a first specific spatial period along the fiber, so that a first set of proteins or peptides is produced simultaneously on the fiber, each protein or peptide within the first set being related to all other protein or peptides in the first set as having a particular amino acid at a particular position in its primary sequence, and being separated from other first set proteins or peptides by the first specific spatial period; and

subjecting said fiber to additional reaction conditions to attach additional amino acids, wherein each of said additional amino acids cycles with a second specific spatial period along the fiber, so that at least one additional set of proteins or peptides is produced simultaneously on the fiber, each protein or peptide within the additional set being related to all other proteins or peptides in the additional set as having a particular amino acid at a particular position in its primary sequence, and being separated from other additional set proteins or peptides by the second specific spatial period, until a desired array of proteins and peptides is obtained.

14. An array of at least two difference proteins or peptides covalently attached to an optical fiber,

wherein the array has linear organization; and

wherein the array is prepared by a method comprising steps of:

- a) providing an optical fiber having reactive functional groups;
- b) winding the fiber around a geometric template;

- c) dividing the surface of the template lengthwise into regions;
- d) subjecting each region to one or more reaction conditions so as to attach amino acids, and thereby to simultaneously create a set of proteins or peptides on the fiber in which each protein or peptide in a set is related to all other peptides or proteins in the set as having a particular amino acid at a particular position in its primary sequence; and
- e) repeating steps (b) through (d) until the desired library is obtained.

3741057v2